ASSESSMENT OF AVIAN MORTALITY FROM COLLISIONS AND ELECTROCUTIONS

Chapter Two: Avian Interactions with Power Lines

Melinda Dorin, Systems Assessment and Facilities Siting Division
Linda Spiegel, PIER Environmental Area

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Energy Commission Interest in Avian Electrocution and Collision on Power Lines

- Interactions with power lines cause outages that result in reliability issues and high costs
- The transmission line system will continue to expand to meet electrical needs
- California is part of the pacific flyway and is home to a large number of wintering birds that use the extensive network of Refuges and flooded agricultural fields
- At the same time of year that wintering habitat is used, visibility is low due to tule fog and transmission lines are hard to see
- Protect the natural resources of the state while supplying electricity to residents
- In the *2003 Environmental Performance Report* a finding was made to limit siting of new transmission lines within Energy Commission jurisdiction in refuges

Current Knowledge

- Although well documented, the extent of electrocutions and collisions have not been accurately quantified
  - There are no surveys being conducted to quantify the number of collisions and electrocutions statewide
- Fatal impacts have been documented for nearly 350 species nationwide (Manville 1999)
- In some cases, collision levels have contributed to declines in local and regional populations (APLIC 1994)
- Nationwide collision estimates range from tens of thousands to over 1.5 million annually. Lack of standardized and repeatable methodology for determining estimates (Erickson 2002).

Current Knowledge Continued

- Electrocutions usually occur at distribution line power poles, 69 kv or less
- Collisions are documented most frequently on transmission lines greater than 69 kV
- More research has been done on documenting and resolving electrocutions than on collisions
- Although annual fatality rates have not been quantified, utilities are taking steps to reduce electrocutions
- For this white paper staff contacted the utilities to see if specific electrocution and collision data (number of birds) were available for this report.
  - Instead staff learned about programs some of the utilities have in place to lower the potential for electrocutions

Collisions with Power Lines

- Occur when birds cross transmission lines in daily use areas (i.e. moving from roosting to foraging habitat)
- Occur when birds migrate through an area
- Rain, fog, night and other low visibility conditions can contribute to collision risk
- Body size, maneuverability, height that birds fly also contribute to collision risk

Electrocutions from Power Lines

- Raptors and large birds are electrocuted through phase to phase and phase to ground contacts
- Small birds can be electrocuted from bushings and transformers and other pole hardware
- Much of the focus remains on reducing raptor electrocutions

Tucson Arizona Study

- Monitored power poles within 500 m of Harris hawk nests (Dwyer 2004)
  - Before retrofits 1.3 electrocutions per nest
  - After retrofits 0.3 electrocutions per nest
    - All electrocutions after retrofits occurred on poles that were only partially retrofitted, or were overlooked; not because of equipment failure
    - Retrofits were successful at reducing electrocutions
- Only about 15% of the interactions resulted in an outage that notified the utility (85% undetected?)
  - The researchers were able to more accurately detect electrocutions and collisions than the automatic relay system
  - The number of birds impacted by electrocution and collision are underestimated

Other Research Results

- A study in Colorado showed perch guards may shift raptors to unsafe portions of the power pole (Harness 1999)
- Few studies on bird flight diverters have been completed, but most found they reduced collision rates (Crowder and Rhodes 1999)

Regulatory Setting

- When constructing new lines, CEQA and sometimes NEPA is required
  - Permitting authority for distribution lines is with the local agency or utility district
  - Transmission lines are permitted by CPUC for the investor owned utilities
- Protection of many of the species killed by electrocution and collision
  - Migratory Bird Treaty Act
  - Bald and Golden Eagle Protection Act
  - California Fish and Game Codes
  - State and Federal Endangered Species Acts

Legal Issues

- The utilities may be reluctant to share fatality data because of the legal repercussions of killing protected species
- The USFWS prosecuted the Moon Lake Utility District which covers part of Colorado and Utah with violations of the MBTA (1999)
- The USFWS settled a case with Pacific Gas and Electric in 2002. Part of the settlement was to develop an Avian Protection Program

What can be done to resolve electrocution and collision issues?

- Survey power lines and poles to more accurately quantify the number of bird deaths
- Establish guidelines for surveys, mitigation, and monitoring
- Develop plans to retrofit existing lines and build new lines to be safe
- Research mitigation measures to determine effectiveness

Guidance Documents

- The Avian Power Line Interaction Committee (APLIC) has been the leading source for information and guidelines
  - Members include utilities and the USFWS
  - *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996,* and
  - *Mitigating Bird Collisions with Power Lines: The State of the Art in 1994*
  - The guidelines are voluntary

Mitigating Bird Collisions with Power Lines: The State of the Art in 1994

Recommends:

- Site analysis and bird use surveys to avoid collision problems
- Bird flight diverters to make the lines more visible
  - Although they may not be as effective in low light conditions when birds can not see them
- Siting guidelines
  - Avoid high bird use areas
  - Site according to topographic features

Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996

Recommends:

- Minimum spacing of 60 inches between phases and phase to ground
- Cover or insulate ground wires and cover conductors
- Changing cross arms and installing perch guards

Introduction to Avian Protection Programs

- The APLIC and the USFWS jointly released guidelines on developing an Avian Protection Plan (April 2005)
- The USFWS is encouraging this voluntary effort
- Plans are focusing on resolving electrocutions
- Not a lot is being done to resolve collisions
- Staff contacted several of the IOUs and Sacramento Municipal Utility District for information and received information on their plans
- To get a statewide picture of electrocution and collision impacts and Avian Protection Plans surveys could be sent to all of the utilities

Southern California Edison
Avian Protection Program

- Retrofit any distribution pole where an electrocution is reported
- All new or rebuilt poles in Raptor Concentration Areas built raptor safe
- If maintenance is completed, pole is retrofitted
- Currently does not keep track of how many power poles are retrofitted
- Notifies USFWS of eagles and endangered species
- Keep an internal database of location and species electrocuted
- Non raptors are the most commonly electrocuted-of raptors, red-tailed hawks and great horned owls

Pacific Gas and Electric Avian Protection Program

- Developed a Utility Operation Standard for migratory birds
  - Report bird interactions to the USFWS
  - All new or rebuilt poles in Raptor Concentration Areas built raptor safe
  - Retrofit all poles and adjacent poles where an electrocution is recorded
  - Plus retrofit an additional 2000 poles annually
  - 18% of bird interactions are from collision
  - 1005 bird-caused outages in 2004

San Diego Gas and Electric Avian Protection Program

- Have 28 areas identified as critical and have plans to retrofit poles
- New poles in these areas built using the raptor safe guidelines
- Use an electronic internal reporting system to track wildlife interactions
- Provide annual training to maintenance crews

Sacramento Municipal Utility District Avian Protection Program

- Does not implement an Avian Protection Plan
- If electrocutions occur at a power pole, that pole is retrofitted
- Since no Plan is in place, new poles are not built raptor safe

Summary of Plans

- Some utilities are developing plans to help address electrocutions
- There are no large standardized studies to determine how many birds are killed annually
- Utilities rely on outage information as the basis for quantifying avian interactions
- The avian interaction information collected by the utilities is not made public

Problems with Retrofitting

- There are millions of existing poles
  - SCE has 1.5 million poles and 60,000 miles of above ground distribution lines
  - PG&E has 5 million poles
  - SDG&E has 400,000 distribution and transmission line poles
  - SMUD has 9,800 miles of distribution lines and 500 miles of transmission lines
- According to the utilities:
  - Some of the retrofit hardware does not last very long (2-3 years)
  - Once retrofitted the pole needs additional maintenance

Costs to the Economy

- Collisions and Electrocutions not only cause impacts to birds but also result in wildfires, power outages and reliability of service
- A PIER-EA report estimated wildlife caused outages cost the state between $32 and $317 million
  - Does not include the value of lost wildlife

- PIER Presentation